

Type 2N3810

Geometry 0220

Polarity PNP

Qual Level: JAN - JANS

Generic Part Number:
2N3810

REF: MIL-PRF-19500/336

Features:

[Request Quotation](#)

- Two electrically isolated, matched PNP transistors as one dual unit.
- Housed in TO-78 case.
- Also available in chip form using the 0220 chip geometry.
- The Min and Max limits shown are per MIL-PRF-19500/336 which Semicoa meets in all cases.



TO-78

Maximum Ratings

 $T_C = 25^{\circ}\text{C}$ unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter voltage	V_{CEO}	60	V
Collector-Base Voltage	V_{CBO}	60	V
Emitter-Base voltage	V_{EBO}	5.0	V
Collector Current, Continuous	I_C	50	mA
Power Dissipation, $T_A = 25^{\circ}\text{C}$, one section	P_T	0.5	W
Derate above 25°C		2.86	mW/ $^{\circ}\text{C}$
Power Dissipation, $T_A = 25^{\circ}\text{C}$, two sections	P_T	0.6	W
Derate above 25°C		3.43	mW/ $^{\circ}\text{C}$
Operating Junction Temperature	T_J	-65 to +200	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 to +200	$^{\circ}\text{C}$

Electrical Characteristics

 $T_C = 25^{\circ}\text{C}$ unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	60	---	V
Collector-Emitter Breakdown Voltage $I_C = 10\ \text{mA}$	$V_{(BR)CEO}$	60	---	V
Emitter-Base Breakdown Voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)EBO}$	5.0	---	V
Collector-Base Cutoff Current $V_{CB} = 50\ \text{V}$	I_{CBO1}	---	10	nA
Collector-Base Cutoff Current $V_{CB} = 50\ \text{V}, T_A = +150^{\circ}\text{C}$	I_{CBO2}	---	10	μA
Collector-Base Cutoff Current $V_{CE} = 50\ \text{V}, I_C = 1\ \mu\text{A}$	I_{EBO}	---	10	nA

ON Characteristics	Symbol	Min	Max	Unit
Forward Current Transfer Ratio				
$I_C = 1\ \mu\text{A}, V_{CE} = 5\ \text{V}$	h_{FE1}	75	---	---
$I_C = 10\ \mu\text{A}, V_{CE} = 5\ \text{V}$	h_{FE2}	100	---	---
$I_C = 100\ \mu\text{A}, V_{CE} = 5\ \text{V}$	h_{FE3}	150	450	---
$I_C = 500\ \mu\text{A}, V_{CE} = 5\ \text{V}$	h_{FE4}	150	450	---
$I_C = 1\ \text{mA}, V_{CE} = 5\ \text{V}$	h_{FE5}	150	450	---
$I_C = 10\ \text{mA}, V_{CE} = 5\ \text{V}$	h_{FE6}	125	---	---
$I_C = 100\ \mu\text{A}, V_{CE} = 5\ \text{V}, T_A = -55^{\circ}\text{C}$	h_{FE7}	60	---	---
Base-Emitter Saturation Voltage				
$I_C = 100\ \mu\text{A}, I_B = 10\ \mu\text{A}$	$V_{BE(sat)1}$	---	0.7	V dc
$I_C = 1\ \text{mA}, I_B = 100\ \mu\text{A}$	$V_{BE(sat)2}$	---	0.8	V dc
$V_{CE} = 5\ \text{V}, I_C = 100\ \mu\text{A}$	$V_{BE(sat)3}$	---	0.7	V dc
Collector-Emitter Saturation Voltage				
$I_C = 100\ \mu\text{A}, I_B = 10\ \mu\text{A}$	$V_{CE(sat)1}$	---	0.2	V dc
$I_C = 1\ \text{mA}, I_B = 100\ \mu\text{A}$	$V_{CE(sat)2}$	---	0.25	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Forward Current Transfer Ratio (Gain Ratio) $V_{CE} = 5 \text{ V}, I_C = 100 \mu\text{A}$	h_{FE3-1} / h_{FE3-2}	0.9	1.0	---
Base Emitter Value, Nonsaturated Absolute Value of Differential, $ V_{BE1} - V_{BE2} _1$ $V_{CE} = 5 \text{ V}, I_C = 10 \mu\text{A}$ $V_{CE} = 5 \text{ V}, I_C = 100 \mu\text{A}$ $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$		---	5.0 3.0 5.0	mV mV mV
Magnitude of Small-Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 5 \text{ V}, I_C = 500 \mu\text{A}, f = 30 \text{ MHz}$ $V_{CE} = 5 \text{ V}, I_C = 1 \text{ mA}, f = 100 \text{ MHz}$	$ h_{FE} _1$ $ h_{FE} _2$	1.0 1.0	---	---
Small-Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}, f = 1 \text{ kHz}$	h_{FE}	150	600	---
Small-Signal, Short Circuit Input Impedance $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	h_{ie}	3.0	30	kohm
Small-Signal, Open Circuit Output Admittance $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	h_{oe}	5.0	60	μohm
Small-Signal, Open Circuit Reverse Voltage Transfer Ratio $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	h_{re}	---	25×10^{-4}	---
Noise Figure $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 100 \text{ Hz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 1 \text{ kHz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 10 \text{ kHz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega$, noise bandwidth 10 Hz to 15.7 kHz	F1 F2 F3 F4	---	7.0 3.0 2.5 3.5	dB dB dB dB
Open Circuit, Output Capacitance $V_{CB} = 5 \text{ V}, I_E = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	C_{OBO}	---	5.0	pF
Input Capacitance, Output Short Circuited $V_{EB} = 0.5 \text{ V}, I_C = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	C_{IBO}	---	8.0	pF